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Maryland Longitudinal
Data System

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Using Longitudinal Data to Assess Long-Term Outcomes Associated with Poverty in Maryland Students

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MLDS Center Research Series
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Introductions and Acknowledgements

- About the presenter:
 - **Dawnsha R. Mushonga**, Ph.D., is an investigator at the MLDS Center and a Postdoctoral Fellow at the University of Maryland School of Social Work (SSW).
- Co-investigators:
 - **Angela K. Henneberger**, Ph.D., is director of the Research Branch at the MLDS Center and Research Assistant Professor at the SSW.
 - **Bess A. Rose**, Ed.D., is a member of the Research Branch at the MLDS Center and statistician at the SSW.
 - **Boyoung Nam**, MSW, is a doctoral student at the University of Maryland SSW.
- Acknowledgements:
 - Thanks to the MLDS Research Team and Research and Policy Advisory Board, participants at the MLDS Research Series and MD Connections Summit, and MSDE staff for helpful input.
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Introduction

- Approximately 15 million children—21% of all children—in the United States live in families with incomes below the federal poverty threshold (National Center for Children in Poverty, 2017).
- In the United States, racial/ethnic minority status is intertwined with poverty: a disproportionately high number of racial/ethnic minorities live in poverty (Reardon, 2016).

Student Poverty and Outcomes

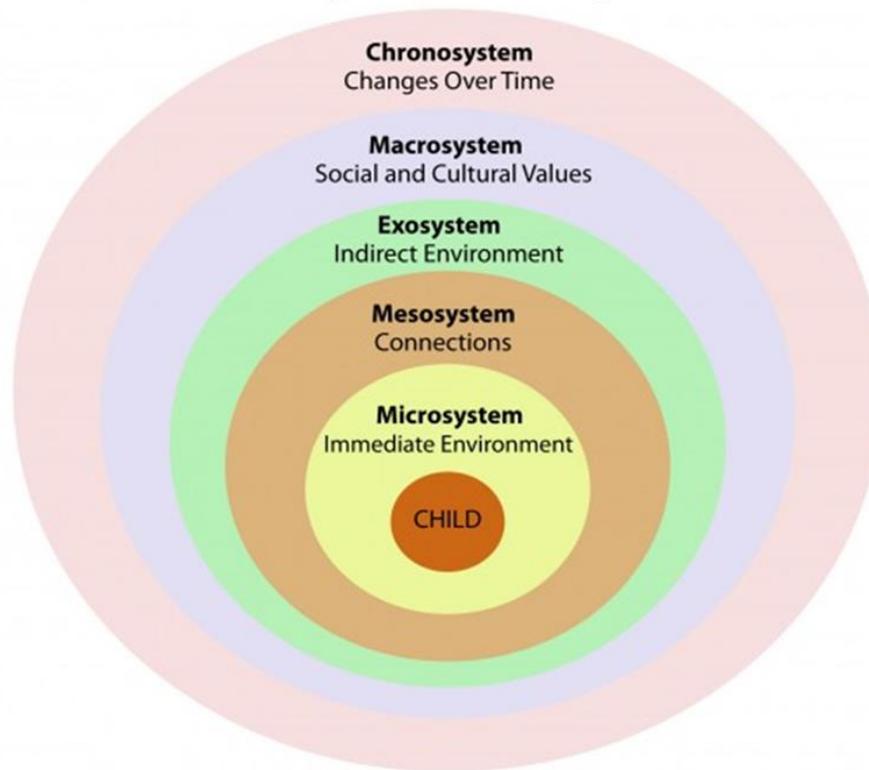
- Poverty has been linked to poor physical health, low academic achievement, poor social and emotional functioning, fewer completed years of education, and lower workforce earnings (Duncan, Magnuson, Kalil, & Ziol-Guest, 2012; Leventhal & Brooks-Gunn, 2000; McLoyd, 1998).
- Children exposed to persistent poverty have more detrimental outcomes than children exposed to transitory poverty (McLoyd, 1998).

School Poverty and Outcomes

- Students' educational outcomes depend on the schools they attend because the education provided by each school reflects the available resources, curriculum, and student body composition of the school (Borman & Dowling, 2010).
- Evidence from observational studies suggests that prolonged residence in poor neighborhoods is detrimental to educational outcomes (Burdick-Will et al. 2011; Harding 2003; Sampson, Sharkey, & Raudenbush 2008; Wodtke, Harding, & Elwert 2011).

Theoretical Framework

Bronfrenbrenner's Ecological Systems Theory



Gaps in Literature

- Data on short-term educational outcomes in Maryland have shown severe gaps in performance between students in poverty and students not in poverty and between minority students and non-minority students.
- Relatively few studies have focused on disentangling the roles of poverty and race on long-term outcomes.

The Current Study

- Examine the relation between student-level poverty (eligibility for free and reduced meals-FARMS) and race and school-level poverty and the school's racial/ethnic composition on students' long-term educational and career outcomes.
- Disentangle student and school-level factors to determine the relevant importance of each across a number of outcomes.

Method: Data

- Linked data sources for K-12, postsecondary, and workforce data
- 6 years of administrative records from MLDS
 - 63,282 students- 6th grade cohort
 - All 24 local school systems in Maryland
- Inclusion criteria
 - Did not transfer out of the MD public school system
 - Enrolled some point during 9th-12th grades
 - Complete demographic data available (gender, race/ethnicity)

Method: Sample Selection

6th grade cohort of students enrolled in MD public schools during 2007-08 academic year
N = 63,282

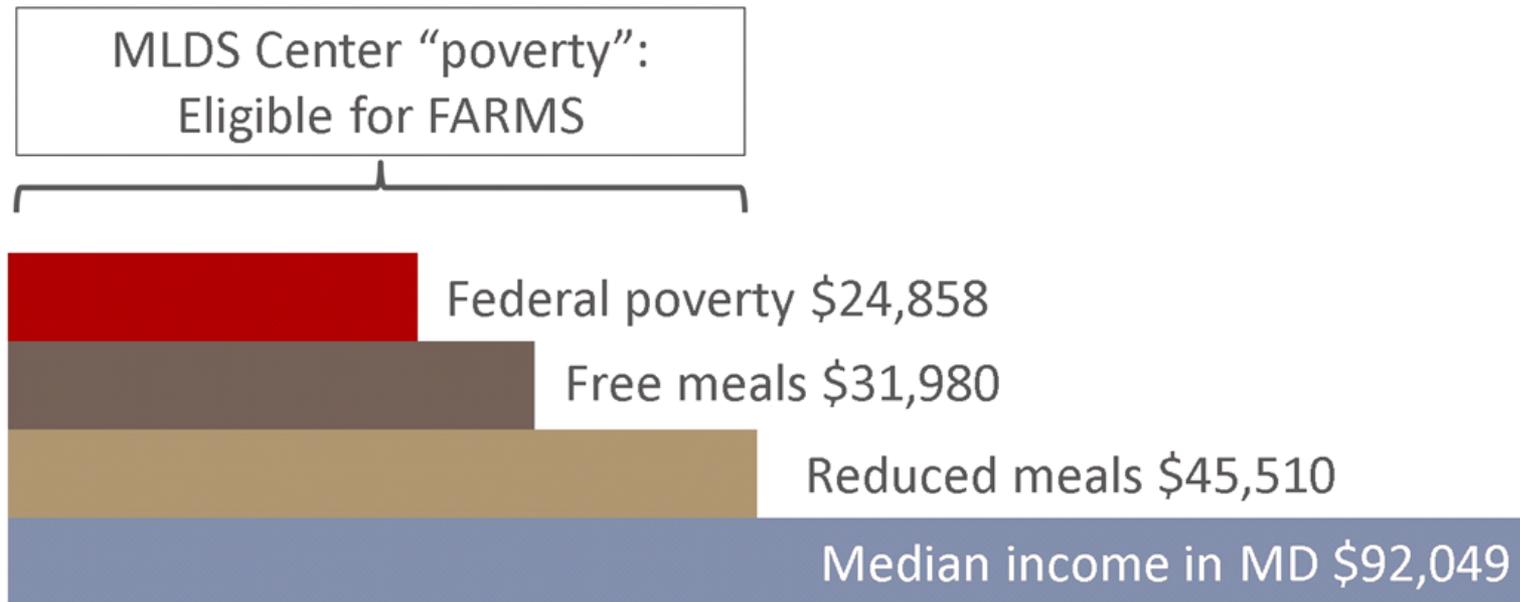


Students remaining in MD public schools
N = 54,516



Students with complete demographic data
N = 54,465

Method: Measuring Poverty



Household income thresholds for a family of 4

Method: Independent Variables

- Independent Variables
 - Level One- student characteristics
 - Student poverty- proportion of time FARMS eligible
 - Student race/ethnicity
 - Level Two- school characteristics
 - School poverty- mean poverty duration of all students in the school
 - School racial/ethnic composition

Method: Measuring Outcomes

- Outcome Variables
 - High school graduation (on-time)
 - High School Assessment (HSA) Algebra scores
 - College enrollment (within one year of HS graduation)
 - Workforce wages (within first year after HS graduation)

Method: Analyses

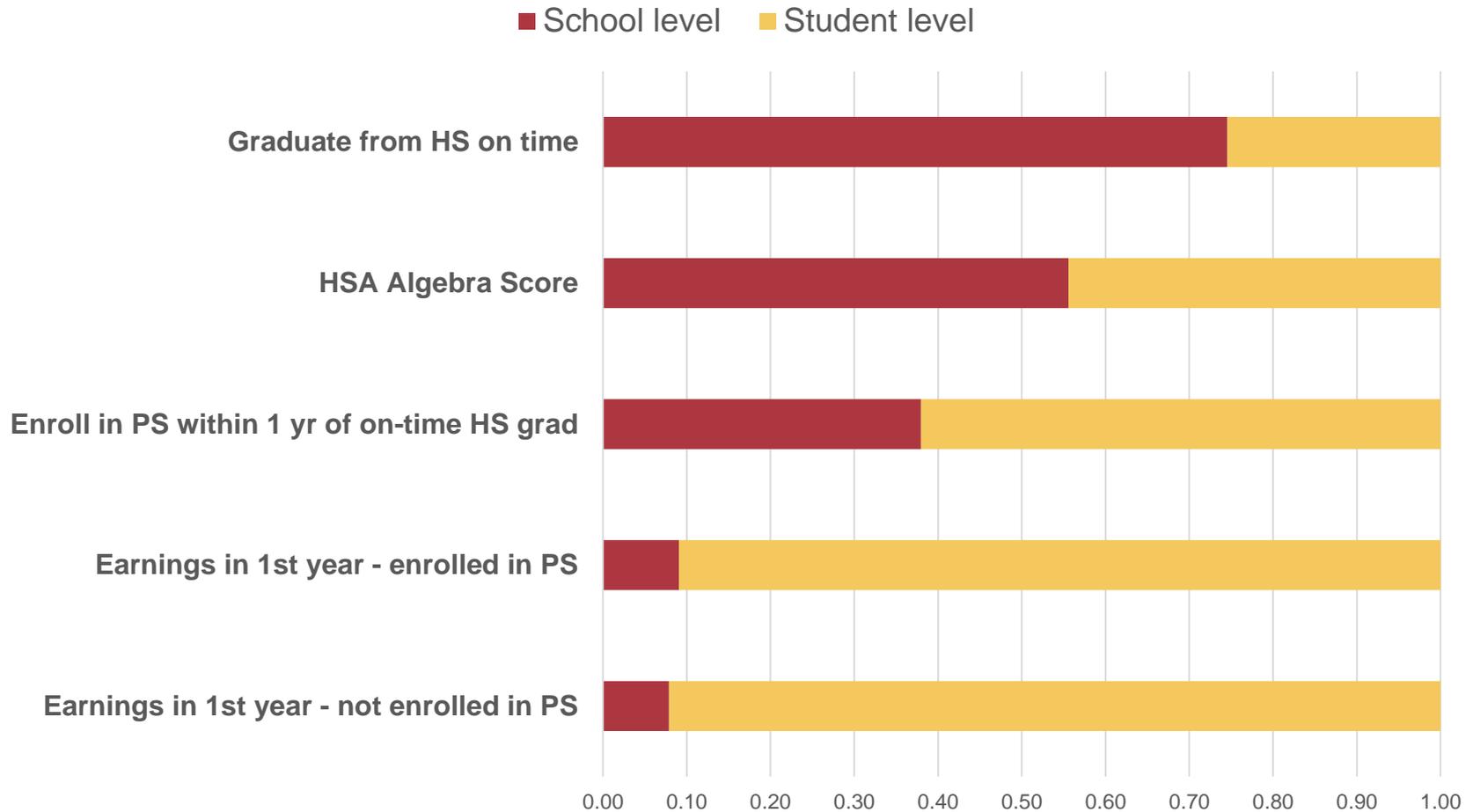
- Multiple Membership Multilevel Modeling
 - Two-level model (Students nested within schools)
- Random effects to model the intercepts
- Fixed effects for the independent variables
- Student poverty, school poverty, school racial composition were standardized ($M = 0$; $SD = 1$)
- Student race variables were grand mean centered



Descriptive Statistics

Variable	Category	%
Race/Ethnicity	Asian	5
	Black	35
	Hispanic	10
	White	45
	Other	4
Gender	Male	50
Experiences between 6th and 12th Grades	Ever in English Language Learner	3
	Ever in Special Education	14
	Ever Homeless	4
	Ever Eligible for FARMS	49

Proportion of variance at school and student levels



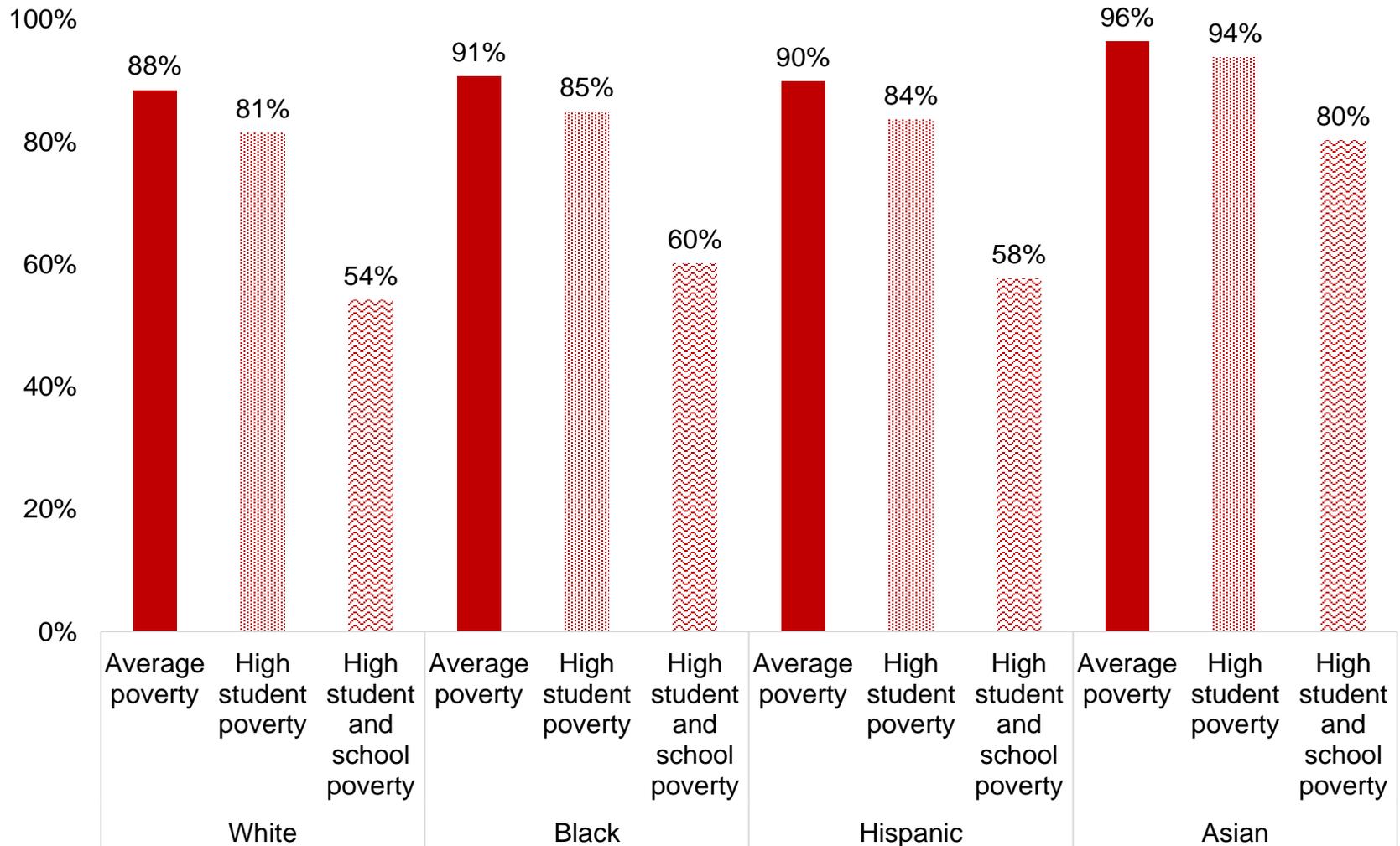


Results: High School Graduation

On-Time High School Graduation	Model 2: Poverty Main Effects (n=54465)				Model 3: Poverty and Race (n=54465)			
	β	SE	OR	Cohen's d	β	SE	OR	Cohen's d
Intercept	1.99***	0.13	7.32		2.03***	0.15	7.65	
Level 1								
Student poverty duration	-0.54***	0.02	0.58	-0.20	-0.55***	0.02	0.57	-0.20
Hispanic					0.15*	0.06	1.16	0.04
Black					0.23***	0.05	1.28	0.07
Asian					1.23***	0.12	3.43	0.22
Other					0.34***	0.09	1.40	0.09
Level 2								
School mean poverty duration	-0.86***	0.10	0.42	-0.35	-1.31***	0.12	0.27	-0.60
School % Hispanic					0.28***	0.08	1.32	0.07
School % Black					0.53***	0.11	1.70	0.13
School % Asian					-0.13	0.11	0.88	-0.04
School % Other					0.03	0.07	1.03	0.01



Results: Predicted Likelihood HS Graduation (On-time)

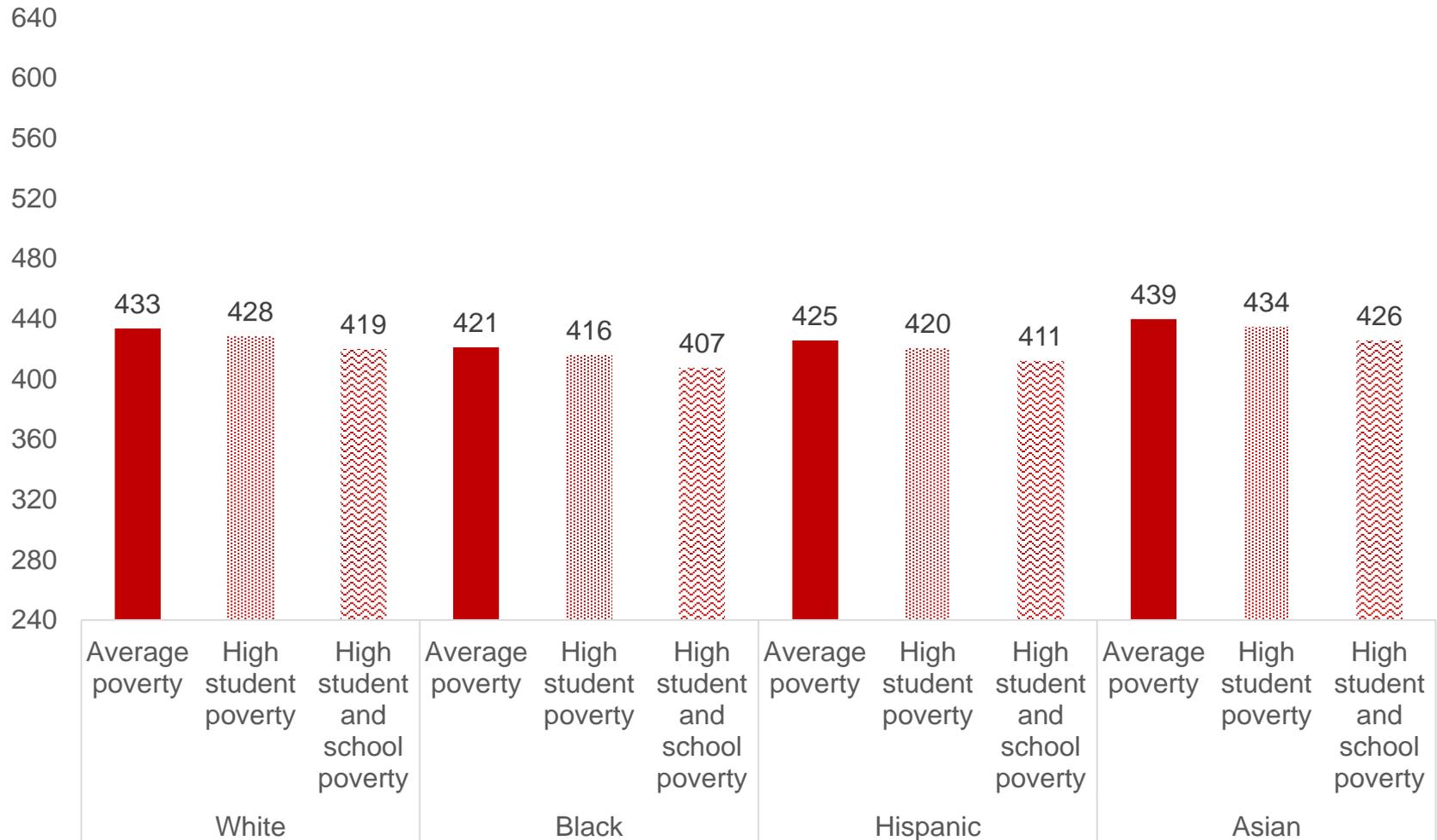


Results: HSA Algebra

HSA Algebra Score	Model 2: Poverty Main Effects (n=52261)			Model 3: Poverty and Race (n=52261)		
	β	SE	Cohen's d	β	SE	Cohen's d
Intercept	432.07***	0.70		433.15***	0.72	
Level 1						
Student poverty duration	-6.40***	0.14	-0.20	-5.15***	0.14	-0.16
Hispanic				-7.96***	0.45	-0.25
Black				-12.24***	0.36	-0.39
Asian				6.10***	0.54	0.19
Other				-2.43***	0.56	-0.08
Level 2						
School mean poverty duration	-12.31***	0.58	-0.39	-8.58***	0.87	-0.27
School % Hispanic				1.54*	0.66	0.05
School % Black				-0.84	0.78	-0.03
School % Asian				3.35***	0.73	0.11
School % Other				0.77	0.50	0.02



Results: Predicted HSA Algebra Scores



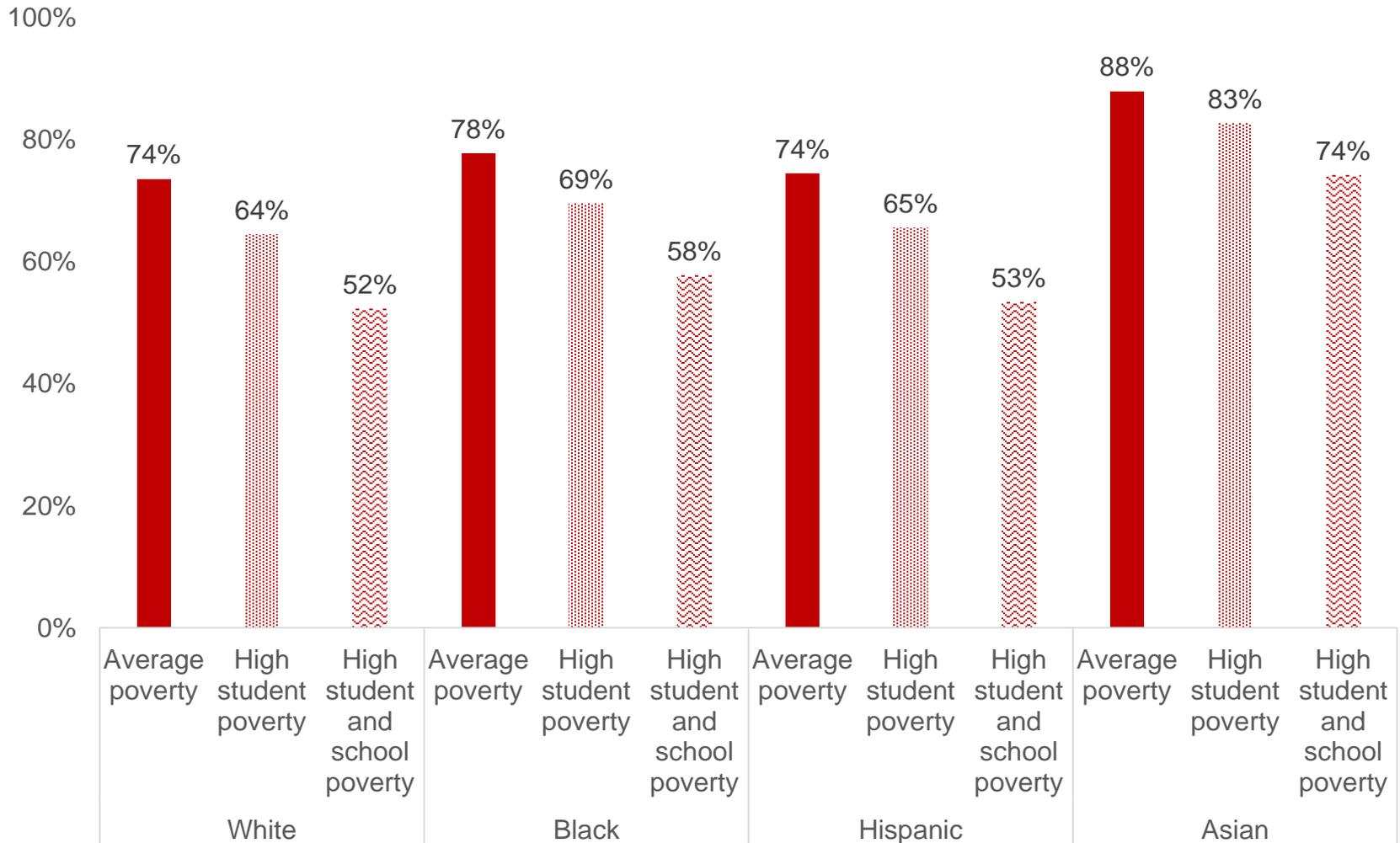


Results: College Enrollment

College Enrollment within 1 st Year of On-Time HS Graduation	Model 2: Poverty Main Effects (n=46581)				Model 3: Poverty and Race (n=46581)			
	β	SE	OR	Cohen's d	β	SE	OR	Cohen's d
Intercept	0.94***	0.04	2.56		1.02***	0.04	2.78	
Level 1								
Student poverty duration	-0.41***	0.01	0.66	-0.20	-0.43***	0.01	0.65	-0.20
Hispanic					0.04	0.05	1.04	0.02
Black					0.22***	0.04	1.25	0.09
Asian					0.96***	0.08	2.62	0.32
Other					0.40***	0.06	1.49	0.16
Level 2								
School mean poverty duration	-0.46***	0.04	0.63	-0.23	-0.51***	0.05	0.60	-0.25
School % Hispanic					0.12**	0.04	1.13	0.05
School % Black					0.14**	0.05	1.15	0.06
School % Asian					0.35***	0.05	1.42	0.14
School % Other					-0.06	0.04	0.94	-0.03



Results: Predicted College Enrollment

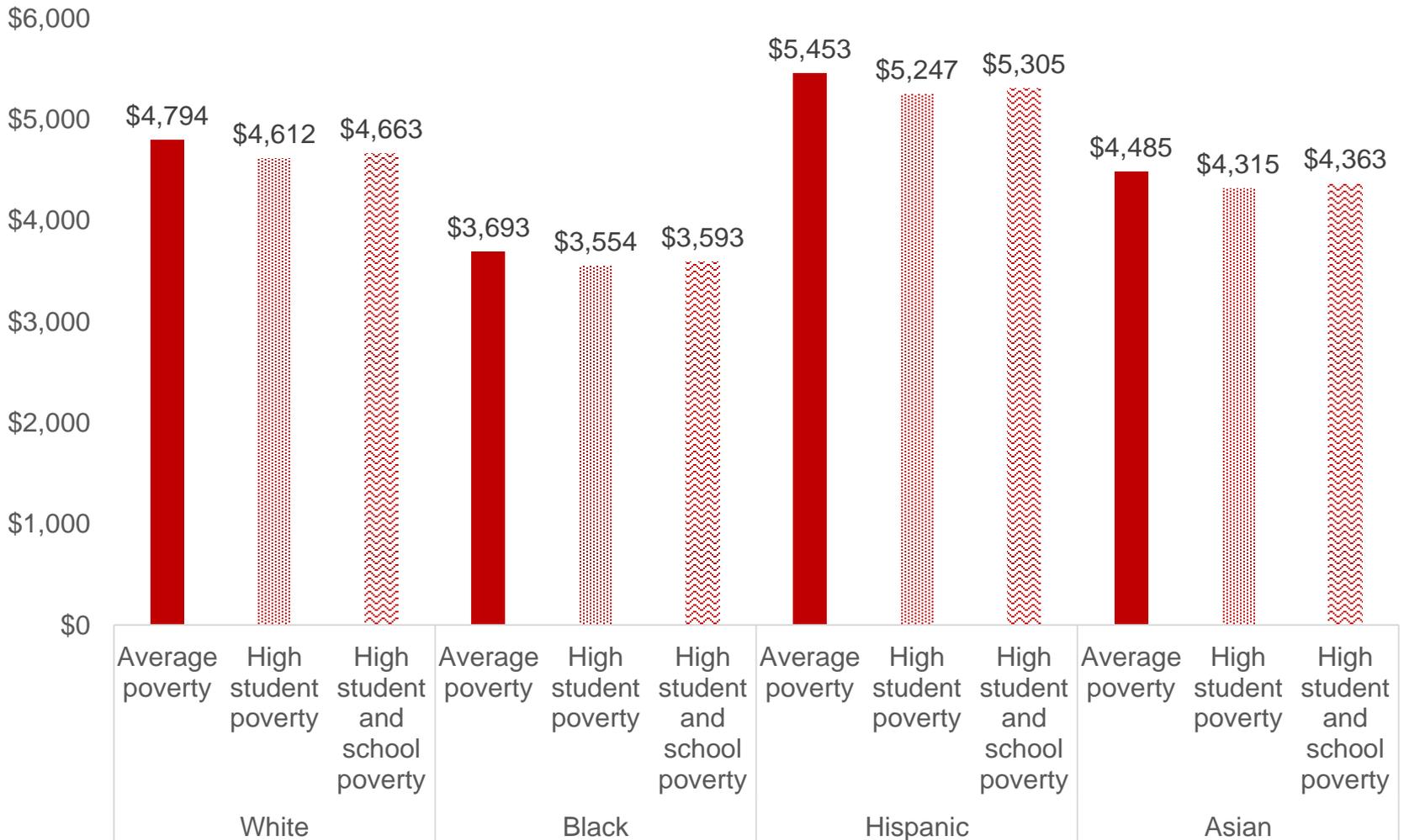


Results: Annual Wages for Non-Postsecondary

Wages (For Non-College Enrollees)	Model 2: Poverty Main Effects (n=8693)			Model 3: Poverty and Race (n=8693)		
	β	SE	Cohen's d	β	SE	Cohen's d
Intercept	8.49***	0.02		8.48***	0.02	
Level 1						
Student poverty duration	-0.05**	0.01	-0.04	-0.04*	0.02	-0.03
Hispanic				0.13*	0.06	0.10
Black				-0.26***	0.04	-0.21
Asian				-0.07	0.14	-0.05
Other				-0.13	0.08	-0.11
Level 2						
School mean poverty duration	-0.07***	0.02	-0.06	0.01	0.03	0.01
School % Hispanic				0.00	0.02	0.00
School % Black				-0.08**	0.03	-0.06
School % Asian				-0.09**	0.03	-0.07
School % Other				-0.02	0.02	-0.02



Results: Predicted Annual Wages for Non-Postsecondary



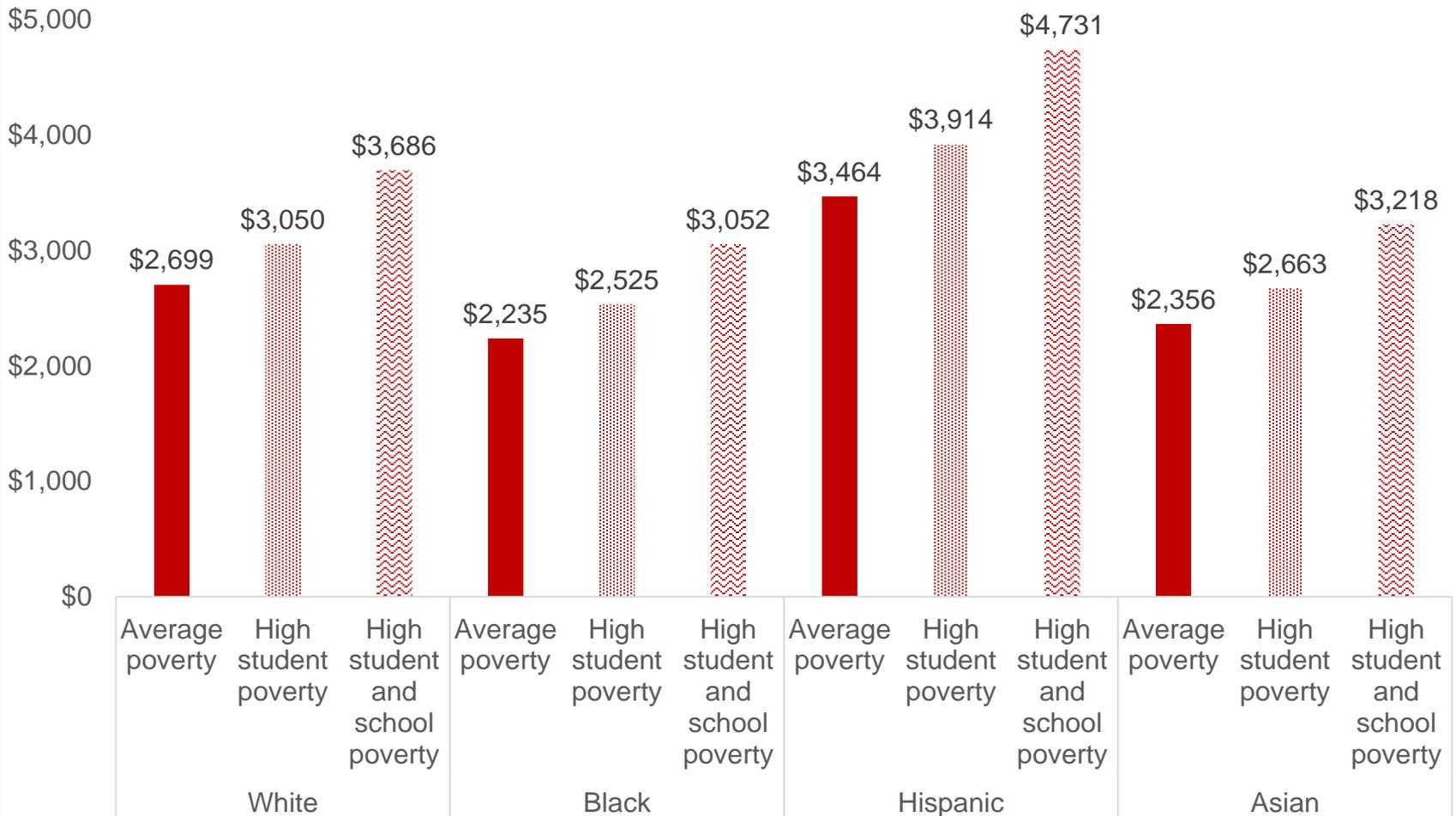


Results: Annual Wages for Postsecondary

Wages (For College Enrollees)	Model 2: Poverty Main Effects (n=23005)			Model 3: Poverty and Race (n=23005)		
	β	SE	Cohen's d	β	SE	Cohen's d
Intercept	7.91***	0.02		7.90***	0.01	
Level 1						
Student poverty duration	0.12***	0.01	0.09	0.12***	0.01	0.10
Hispanic				0.25***	0.03	0.20
Black				-0.19***	0.03	-0.15
Asian				-0.14***	0.04	-0.11
Other				-0.10*	0.04	-0.08
Level 2						
School mean poverty duration	0.04*	0.02	0.03	0.19***	0.02	0.15
School % Hispanic				-0.08***	0.02	-0.07
School % Black				-0.16***	0.02	-0.13
School % Asian				-0.10***	0.02	-0.08
School % Other				0.01	0.02	0.01



Results: Predicted Annual Wages for Postsecondary



Summary of Results

- Both student and school-level poverty were related to long-term academic outcomes, even after controlling for individual student race and school racial/ethnic composition.
- School concentration of poverty, regardless of individual poverty experience and race, usually predicts worse educational outcomes.
- Racial and ethnic gaps in standardized test scores persist regardless of student and school-level poverty.
- Racial and ethnic gaps in high school graduation and postsecondary enrollment disappear or are reversed when controlling for student and school-level poverty and school's racial/ethnic composition.
- Poverty related to lower annual wages for students not enrolled in college and higher annual wages for those enrolled in college.

Discussion

- Prior research reports that income-related achievement gaps are established before kindergarten and persist throughout K-12 education (Reardon, 2011; Reardon, 2013)
- May be due to a number of factors, including:
 - Insufficient resources (Jencks & Mayer, 1990)
 - Lower quality teachers (Lankford, Loeb, & Wyckoff, 2002)
 - Unequal access to social capital (Putnam, 2000)
- Racial/ethnic gaps in most outcomes disappear after controlling for poverty, which may be consistent with cultural differences in achievement motivation (Trumbull & Rothstein-Fisch, 2011)
- The persistence of racial/ethnic gaps in test scores even after controlling for poverty is consistent with literature on stereotype threat (Alter, Aronson, Darley, Rodriguez, & Ruble, 2010)

Discussion Cont'd

- In this study, poverty was related to lower annual wages for students not enrolled in college and higher annual wages for those enrolled in college
- Education promotes economic success and social mobility and serves a protective effect against the detrimental role of poverty (Engle; 2007; Ruzojcic et al., 2018)
 - May help to explain why poverty is related to lower annual wages for students not enrolled in college
- Even after receiving financial aid for college, a considerable portion of need typically remains unmet, especially for students from low-income backgrounds (Pike et al., 2008; Long & Riley, 2007)
 - May help to explain why poverty is related to higher annual wages for students who were enrolled in college

Limitations

- Data only available starting 2007-08 academic year
- Excluded Maryland students not attending public schools
- Poverty indicator (FARMS eligibility) may not accurately capture true student and school poverty
- Workforce data excluded federal employees, private contractors, or self-employed individuals
- Additional variables at the student and school level were not included
- Excluded student's employment status (full or part-time)

Future Research

- Examine the protective role of additional student and school level characteristics
- Include elementary levels to assess effects of poverty during the entire K-12 experience
- Examine additional college and career outcomes (e.g. college persistence and degree attainment, workforce trajectories)
- Compare measures of poverty (FARMS vs census data)

Implications

- Implementation of additional programs and policies for students living in poverty and schools with high concentrations of poverty.
- Focus on strengths within high-poverty schools to better support students.
- Establish partnerships within the surrounding community to increase academic and/or career success.

For More Information



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**Poverty and Student Outcomes:
Disentangling the Effects of Student and School Poverty**

Bess A. Rose, Dawnsha R. Muzhonga, and
Angela K. Hennisberger
May 3, 2018
University of Maryland, School of Social Work



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The Role of Concentrated Poverty and Race in Long-Term Academic Outcomes

Commission on Innovation and Excellence in Education
July 13, 2018

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**Poverty and Long-Term Educational Outcomes:
Variation by Level of School Poverty, Student Poverty, and Local School System**

Commission on Innovation and Excellence in Education
August 15, 2018

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